CMPT 276 Class 15: Economic and Societal Issues

Dr. Jack Thomas

Simon Fraser University

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Today's Topics

1. Systemic questions that go **beyond the conventional bounds** of professional ethics.

2. An introduction to **labour** and the workplace.

3. **Representation, diversity, and inclusivity** within the tech industry.

4. The effects of technology on **society**.

Now Entering the Cool Zone

- Most "professional ethics" over-emphasizes the importance of your own **personal moral agency**, ignoring **systemic questions**.

- For example – are software engineers (or engineers in general) **workers**?

Are Software Engineers Workers? Professionals? Scientists?

- Careers in **STEM** (Science, Technology, Engineering & Mathematics) are seen as more prestigious than working-class jobs.

- Yet the majority of graduates from STEM programs will be working **full-time wage labour** – if they're lucky.

- A simple test – do you own the thing you're working on? No? Then you're a worker.

Political, but not Economic Democracy

- Speaking primarily about North America and Europe, **workers generally don't control the direction of their companies**, and can't afford to refuse work regardless of ethics.

- Large companies create gruelling working conditions which detach workers from the result of their work, producing **alienation** and leading to stress and burnout.

Scrum, Startups, and Ownership

- "Startup culture" encourages the view that anyone can be their own boss, and hard work will be rewarded.
  - In practice, the playing field is warped toward those with access to investment capital, when it's not creating outright scams or garbage.
- Agile methodologies presume an **idealized state of equality** across the team, all of whom are committed to making the best software possible for its own sake.
  - Large companies are happy to adopt this language and style to motivate workers, but don't match it with actual control – the "product owner" is rarely the owner of the product.

Exploitation is an Endemic Problem

- Crunch time

Like the software industry more broadly, the gaming world is known for "crunch," the period just before a launch when workers are expected to put in 100-hour weeks with no extra pay. In decades past, especially for console games, that crunch period was typically limited to the weeks before a game's release date. But conditions are worsening in part because the underlying technology powering video games is changing, altering players' expectations — and the industry more broadly — in the process.

Credit: https://time.com/5603329/e3-video-game-creators-union/#:~:text=Like%20the%20software%20industry%20more,before%20a%20game's%20release%20date.

Exploitation is an Endemic Problem

- Layoffs

Video Game Layoffs Are So Common, This Person Built a Website to Track Them

A depressing way to better understand the broken foundations of the video game industry.

By Patrick Klepek

Credit: https://www.vice.com/en_ca/article/dygp3a/video-game-layoffs-are-so-common-this-person-built-a-website-to-track-them

Exploitation is an Endemic Problem

- Outsourcing & Automation?

Credit:

https://www.businessinsider.com/sc/ibm-automation-ai-disruption-technology-2018-3#:~:text=Automation%20isn't%20new.,deliver%20their%20products%20and%20services.

As with any technology that will have a positive and lasting impact on an industry, one of the keys to maximizing the benefit of new innovations lies in preparing more people with the skills needed to partner effectively with those systems. AI and automation are creating new partnerships between man and machine. This is man with machine working to deliver higher value, not man versus machine. So, the question isn't just, "Will automation create jobs?" It's, "How will automation re-create jobs?" As automation combined with AI moves to the forefront of our industrialized world, it is poised to accelerate business transformation in today's digital economy, allowing us to work smarter while enabling growth.

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Exploitation is an Endemic Problem

Amid the coronavirus pandemic, many companies could replace their workers with robots

Annie Nova
@ANNIEREPORTER

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Credit: https://www.cnbc.com/2020/06/06/how-companies-plan-to-hire-robots-after-coronavirus-layoffs.html

Exploitation is an Endemic Problem

- These are not the result of individually immoral owners or managers, but the **pressure of the market** – if they don't do these things, someone else will.

- This is what is meant by a **systemic problem**, one which results from how our society is structured that goes beyond individual morality or professional ethics.

How To Fight for your Rights

- Don't expect companies to do this on their own – **Human Resources isn't your friend**.

- Watch out for **the myth of the rugged individualist** software developer who can do it all on their own.

- The key to this struggle is **solidarity**, the recognition that you have more in common with your fellow workers across the industry (and across society) than you do with the managers and owners that control your livelihood.

Securing Your Rights in the Tech Industry

- Know your rights!
  - BC Tech Fact Sheet: https://www2.gov.bc.ca/gov/content/employment-business/employment-standards-advice/employment-standards/forms-resources/high-technology-companies

- Form a union!

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How Kickstarter Employees Formed a Union

The point wasn't so much about pay issues, but to give workers more say over what they produce—reflecting a trend of internal protest across the tech industry.

Credit: https://www.wired.com/story/how-kickstarter-employees-formed-union/

Gamers Rise Up

- The **games industry is a particularly egregious offender**, exploiting the enthusiasm of their own fans.

- Unionization efforts include the Communication Workers of America and Game Workers Unite International.

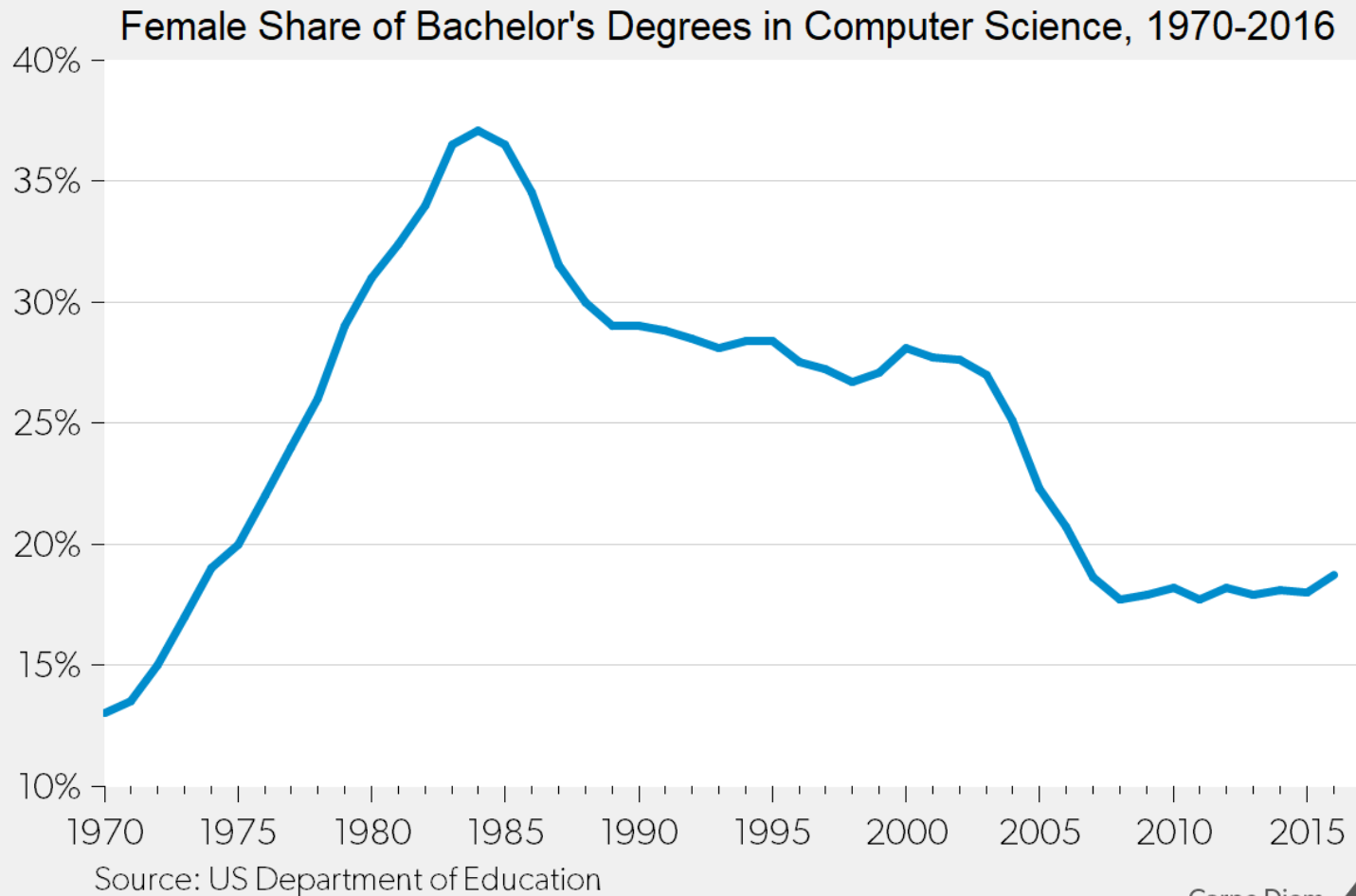- There are also alternate workplace models, like the worker-owned cooperative Motion Twin.

Brief Aside: The Problem With "Learn To Code!"

- Because tech industry jobs are seen as one of the few remaining growing industries, it becomes **a catch-all solution for unemployment**.

- This has the dual effect of **flooding the labour pool** to drive down wages, and **shifting blame** for the unemployed's joblessness onto themselves.

- As automation ramps up and the economy struggles to recover, this blame-shifting to workers for their own unemployment will only get more intense.

The Demographic Skew in the Tech Industry (or, Why This Whole Thing Smacks of Gender)

- The tech industry is **significantly unequal** in terms of **race, gender, class, etc**.

- This isn't about assigning guilt, but **understanding why** and the consequences of this imbalance.

- **Note**: This examination is primarily about the Western, particularly North American "High Technology" industry, and speaks generally – there is a lot of variation!

- ~20% of U.S. CS Majors are women, and this number has actually dropped over time.

Female Share of Bachelor's Degrees in Computer Science, 1970-2016

Source: US Department of Education

Carpe Diem AEI

Credit: https://www.aei.org/carpe-diem/chart-of-the-day-the-declining-female-share-of-computer-science-degrees-from-28-to-18/

A Specifically CS Problem

- Tech lags behind other fields as well, including within STEM:

Percentage of Degrees Earned by Women in Postsecondary Institutions in the United States (2015-2016)			
	Bachelor's	Master's	PhD
Biological and biomedical sciences	59.9%	57.3%	53.0%
Mathematics and statistics	42.5%	41.7%	28.5%
Physical sciences and science technologies	38.8%	37.8%	32.2%
Engineering and engineering technologies	19.7%	25.2%	23.5%
Computer and information sciences and support services	18.7%	30.8%	20.1%
All STEM Fields[3]	35.5%	32.6%	33.7%

Credit: https://www.catalyst.org/research/women-in-science-technology-engineering-and-mathematics-stem/

The Challenges Facing Women in CS Are Not Hypothetical

- You may have already experienced or seen others experiencing some of the additional hurdles facing women in technology.

- "An unwelcoming environment" doesn't do the problem justice – the exceptionally low rate of admissions of women in CS compared to other STEM fields clearly indicates many prospective female students are **discouraged before even applying**.

- The reputation of the field, "gatekeeping" from male members of the industry, or negative personal experience all contribute to this phenomenon.

A History of Accomplishment and Adversity

- At first, 100% of programmers were women: **Ada Lovelace** was the original programmer of Charles Babbage's Analytical Engine.

- Before the digital era, **"computer" was a job title**, and during WW2 was predominantly filled by women.

- This role transferred into the operators of the first mechanical computers built to take over calculation duties, **the forerunners of the modern computer programmers**.

Image Credits: https://en.wikipedia.org/wiki/Ada_Lovelace, https://www.nasa.gov/content/katherine-johnson-biography
History Credit: https://www.sfu.ca/wwest/WWEST_blog/herstory-of-the-tech-industry-when-womenwerecomputers.html#:~:text=In%20fact%2C%20the%20computer%20programming,in%20the%20history%20of%20computing.

A History of Accomplishment and Adversity

- Male-dominated fields are often better-compensated and given more social prestige. As the computer boom of the 80s attracted more money to the industry, it also **gained prestige, and therefore became more male-coded**, kicking off a self-reinforcing cycle.

- Contrast with how as medical and biological sciences have become predominantly female, they start to **be painted as "soft science" and can even be underpaid** (I.e. doctors in Russia vs. in North America, or doctors vs. nurses generally).

Credit: https://www.nytimes.com/2016/03/20/upshot/as-women-take-over-a-male-dominated-field-the-pay-drops.html/
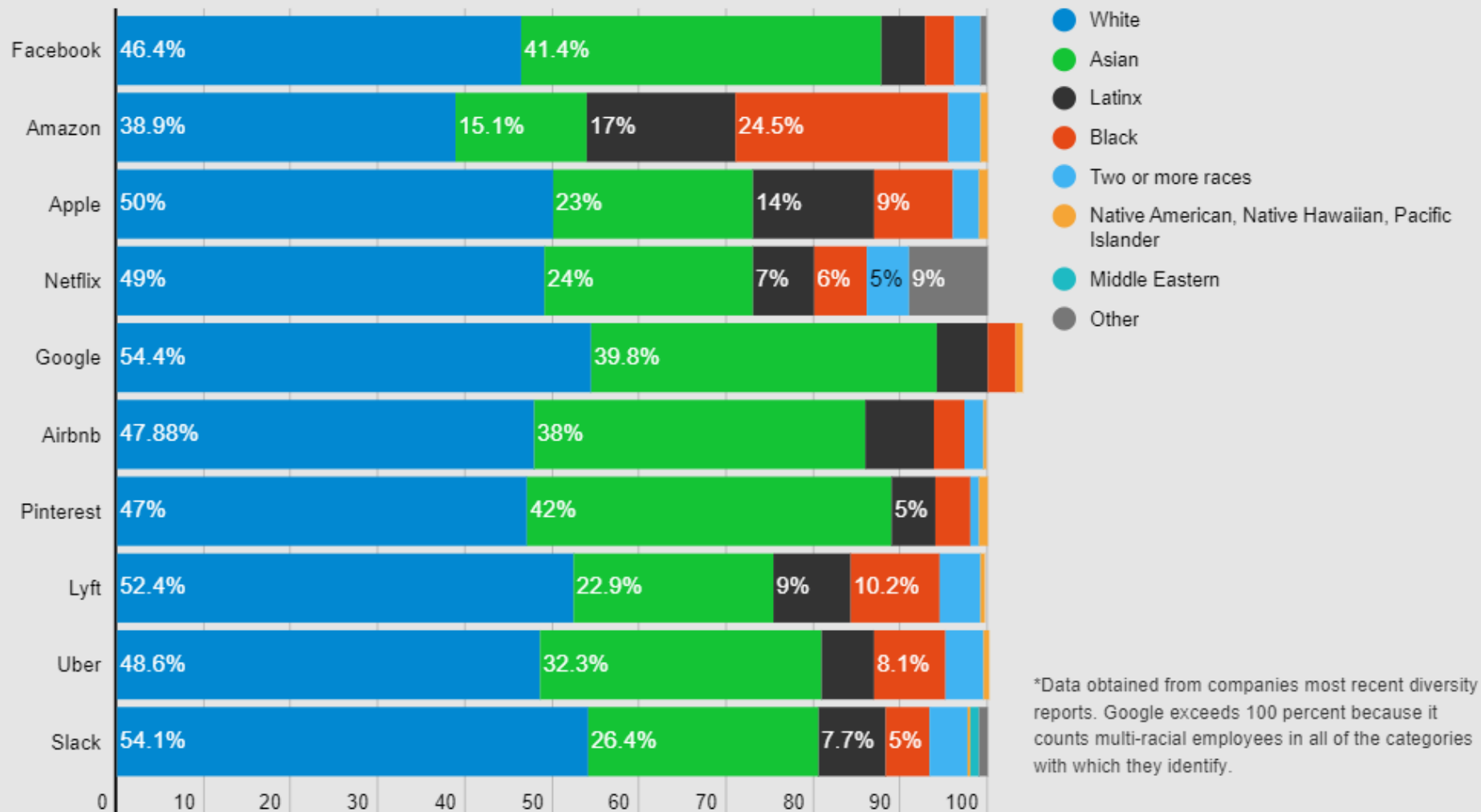
A History of Accomplishment and Adversity

- Despite these obstacles, women in CS have achieved great things, like **Margaret Hamilton**, the software lead for NASA's Apollo mission.

- For more history, follow the link two slides back from the Westcoast Women in Engineering, Science, and Technology (**WWEST**).

Image Credit: https://www.theguardian.com/technology/2019/jul/13/margaret-hamilton-computer-scientist-interview-software-apollo-missions-1969-moon-landing-nasa-women

Racial Diversity in Silicon Valley

How major tech companies stack up against each other

Legend:
- White
- Asian
- Latinx
- Black
- Two or more races
- Native American, Native Hawaiian, Pacific Islander
- Middle Eastern
- Other

Company	White	Asian	Latinx	Black
Facebook	46.4%	41.4%		
Amazon	38.9%	15.1%	17%	24.5%
Apple	50%	23%	14%	9%
Netflix	49%	24%	7%	6% ... 5% ... 9%
Google	54.4%	39.8%		
Airbnb	47.88%	38%		
Pinterest	47%	42%	5%	
Lyft	52.4%	22.9%	9%	10.2%
Uber	48.6%	32.3%		8.1%
Slack	54.1%	26.4%	7.7%	5%

*Data obtained from companies most recent diversity reports. Google exceeds 100 percent because it counts multi-racial employees in all of the categories with which they identify.

TC

Credit: https://techcrunch.com/2019/06/17/the-future-of-diversity-and-inclusion-in-tech/

Complexity of Racial Representation

- Non-white representation within the North American tech industry **is influenced by the global economy**, itself a complicated issue.

- A mobile, globalized tech workforce **creates tension** with local communities excluded from the industry but affected by their presence.

- Clear that historically marginalized groups in North America (African Americans, Natives, Latinx) have **unequal access to the field**.

Not Just A Stats Issue

- In an industry that depends heavily on networking and social capital, this can limit opportunities and create an "**unwelcoming**" **(closed, hostile, even dangerous) environment, which becomes self-reinforcing**.

- Can also lead to **reproducing unconscious bias** within technology, especially in machine learning, and the **naïve development of technology** with grave social implications for certain demographics.

Data Can Reproduce Bias

The New York Times

Facial Recognition Is Accurate, if You're a White Guy

By Steve Lohr

Feb. 9, 2018

In modern artificial intelligence, data rules. A.I. software is only as smart as the data used to train it. If there are many more white men than black women in the system, it will be worse at identifying the black women.

One widely used facial-recognition data set was estimated to be more than 75 percent male and more than 80 percent white, according to another research study.

Credit: https://www.nytimes.com/2018/02/09/technology/facial-recognition-race-artificial-intelligence.html

Technology Carries Different Consequences for Different Communities

ACLU 100 YEARS

Abou

NEWS & COMMENTARY

How is Face Recognition Surveillance Technology Racist?

If police are authorized to deploy invasive face surveillance technologies against our communities, these technologies will unquestionably be used to target Black and Brown people merely for existing.

Credit: https://www.aclu.org/news/privacy-technology/how-is-face-recognition-surveillance-technology-racist/

I Myself Have Fallen Into This Trap

Smarter Cities, Safer Travels:
Intergrating Contextual Suggestion

Adriel Dean-Hall
University of Waterloo
adeanhal@uwaterloo.ca

Jack Thomas
University of Waterloo
j26thoma@uwaterloo.ca

ABSTRACT

Contextual suggestion is meant to provide meaningful venue recommendations tailored to a personal profile, but sometimes a user's information need goes beyond their taste in restaurants. This paper seeks to demonstrate that integrating information concerning crime reports and public safety alerts into suggestions allows for more informed decision-making by users. We will explore existing sources of this

As the paradigm shifts toward making this data open and accessible to users, contextual suggestion developers can draw on this information to improve the suggestions they make.

"Contextual suggestion" covers an ongoing field of research at the border of search and recommendation meant to provide personalized recommendations to users for "points of interest", such as venues and other attractions. The subject

The Origins Of This Issue Is Clear, Even Obvious, But Worth Restating

- The tech industry does not exist in a vacuum, it **inherited the social characteristics** of the societies and eras it grew out of.
- Many groups underrepresented in tech, like other areas of society, **faced official repression within living memory**, and neither the consequences nor the repressive beliefs were erased with the laws.
- **Identity remains a secondary indicator for class**, which affects economic and educational opportunities.

At the Intersection of Class, Race, and Identity

CNBC

'San Francisco is full': Tech backlash reaches new heights with skyscraper battle

PUBLISHED THU, MAR 5 2020·3:45 PM EST   UPDATED THU, MAR 5 2020·3:45 PM EST

NBC NEWS | David Ingram

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KEY POINTS

- Proposition E, a measure on the ballot Tuesday in San Francisco, would peg the amount of new office space available to the amount of affordable housing built.

Credit: https://www.cnbc.com/2020/03/05/san-francisco-tech-backlash-proposition-e-skyscraper-battle.html

The Managerial "Solution": Incentives and Training Workshops

- Seeking a market-based solution to discrimination leads to hunting for **the lowest price point** that will get the marginalized to swallow their discomfort.

- For the rest, sensitivity training (while having value on its own) primarily offers organizations the chance to **shift the blame onto individuals**.

- Remember, businesses only began taking "brave stands" on these issues when **market research calculated it was more profitable**.

Case In Point,
Remember Gay Marriage?

Credit: https://mattbors.com/blog/2013/03/27/the-gay-marriage-rush/index.html
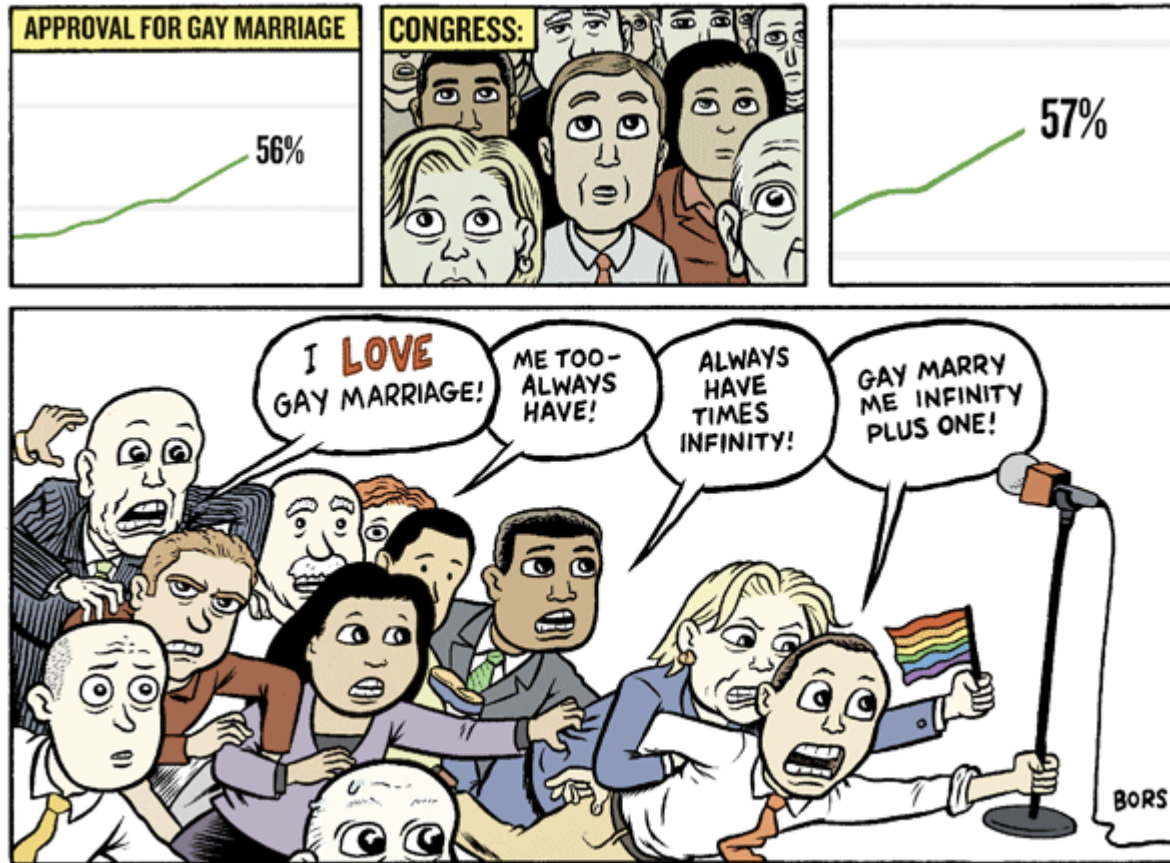
Will It Get Better Over Time?

"The arc of the moral universe is long, but it bends toward justice" –Martin Luther King Jr.

- That change comes about by conscious human action, not natural forces.

- There is no shortcut for the hard work of making the change you want to see yourself.

Okay, So What Should We Do About It?

- Not a top-down hiring solution, but a **bottom-up organizing one**, meaning you can play a part no matter who you are.

- Build **solidarity** in the workplace to break down divisions without erasing differences.

- Become involved in the **local community** you live in, instead of insulating yourself.

Speak Out, Get Involved

- Reading and discussion is good, but should lead to **praxis**: putting theory into practice.

- Get to know your fellow CS students at SFU through societies, like the **Computing Science Student Society.**

- The **Women in Computing Science society** (WiCS) does good work to support female CS students, and is open to everyone.

- The **Simon Fraser Public Interest Research Group** is also a good portal into community issues.
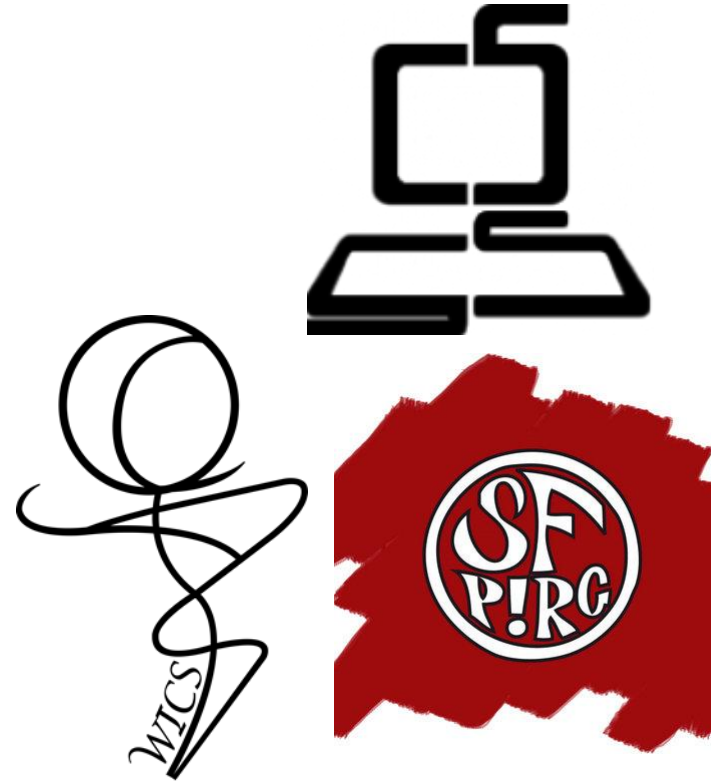
Proactive Steps

- **Training**, **self-examination**, and being aware of and vigilant against **unconscious bias** are important steps individuals can take.

- **Formalize hiring and promotion criteria** to cut down on "gut feeling" and "culture fit".

- **Call out bias where you can** – sometimes just an honest discussion is needed, other times active malice must be confronted.

- Where you can't, **organize with peers** to build solidarity and power so that you can later!

Hot Take: We Live In A Society

"There's no such thing as society." -Margaret Thatcher (Former British PM)

- Market-based societies encourage us to see everything through the lens of **individual consumer choices and employment relationships**.

- Instead, let's think about the consequences of our work **as members of the society** being impacted.
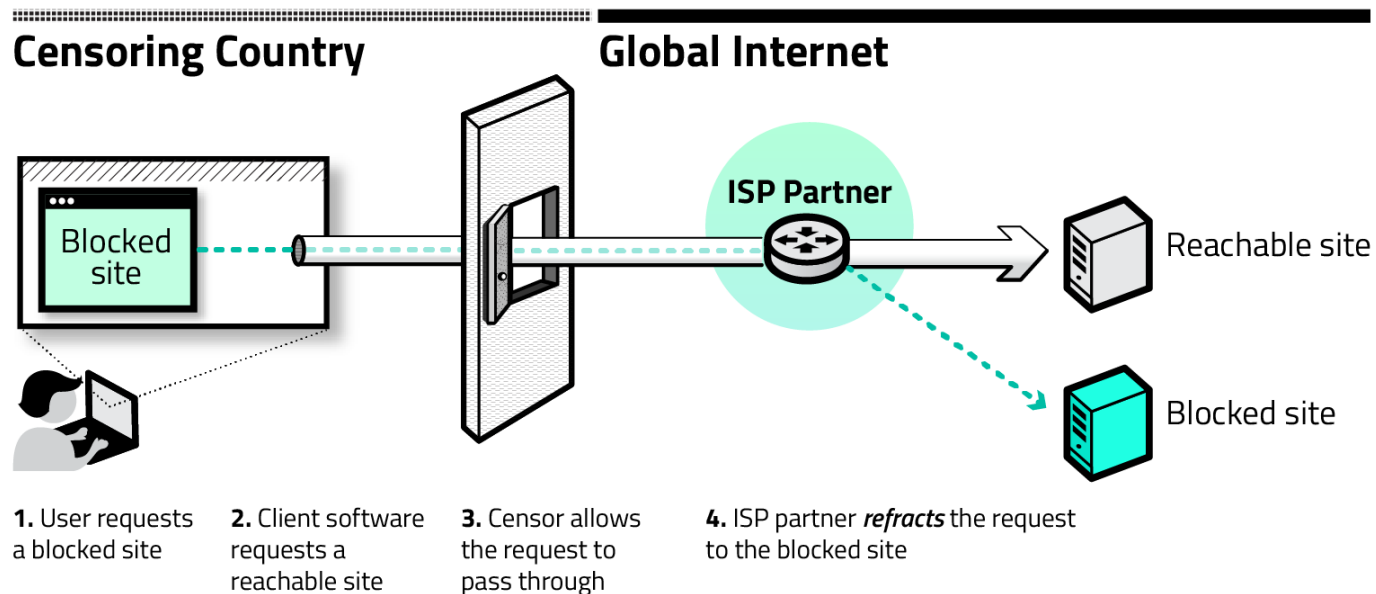
Automation of Labour

- The highest profile research projects in Silicon Valley today are about putting people out of work (the autonomous car).

Image Credit: https://www.forbes.com/sites/cit/2015/03/20/meet-the-robot-armies-that-are-transforming-amazons-warehouses/#65e0f1465a15

Privacy & The Panopticon

- From social media companies data-mining your purchases to governments tracking your every move.

Censoring Country   **Global Internet**

Blocked site

ISP Partner

Reachable site

Blocked site

1. User requests a blocked site

2. Client software requests a reachable site

3. Censor allows the request to pass through

4. ISP partner *refracts* the request to the blocked site

https://refraction.network

Image Credit: https://refraction.network/

The Gig Economy and Online Monopolies

- Small businesses are crushed by online companies, while formal employment gets replaced by uncertain app-based jobs that pay less than minimum wage.

Image Credit: https://www.personneltoday.com/hr/cipd-festival-of-work-not-all-gig-economy-work-is-bad/

The Gig Economy and Online Monopolies

The New York Times

What Happened in California Is a Cautionary Tale for Us All

A voter-approved measure strips gig workers of basic protections enjoyed by employees in other businesses.

Image Credit: https://www.nytimes.com/2020/11/13/opinion/prop-22-california-gig-workers.html

Autonomous Weapons and Policing

- Using machines as the "solution" to military and police brutality with a perfectly loyal and unaccountable enforcement arm.

Image Credit: https://www.businesswire.com/news/home/20190226005943/en/Knightscope-Security-Robots-Rack-Crime-Fighting-Wins

Social Media

- **Privatizing the Discourse**: the biggest platforms of public debate are now owned and policed by private businesses (Twitter, Facebook, etc).

- **Mass Disinformation Campaigns:** while some bad actors deliberately try to spread disinformation, an order of magnitude more is produced purely organically.

The Problem With Individual "Consumer" Ethics

- In a market-based society, an individual can only "vote with their dollar" by refusing to buy a product or work on a project. **This has no effect** if someone else will take the job, or you're not the target customer.

- Democracy is supposed to provide a check on private interests working against the public good, but **illicit profits from these interests can buy off the system**.

- Collective action problems require **collective thinking and collaboration** to solve.

- **Activism** is alive within technology.

Preemptive Defense

Credit: https://thenib.com/mister-gotcha/
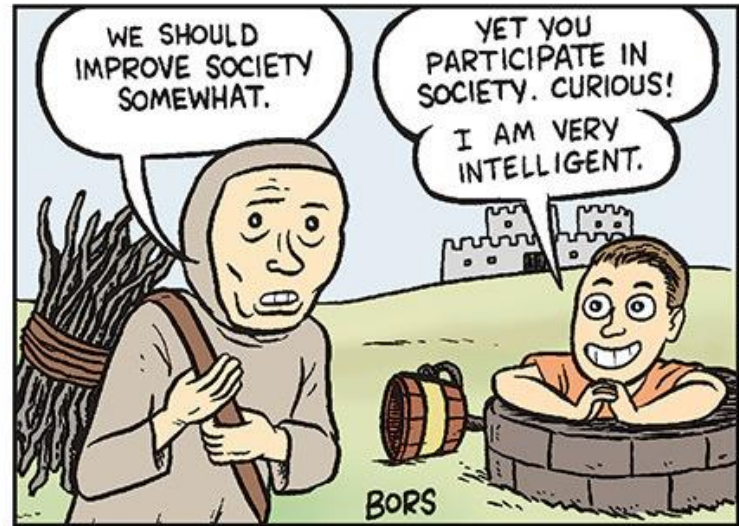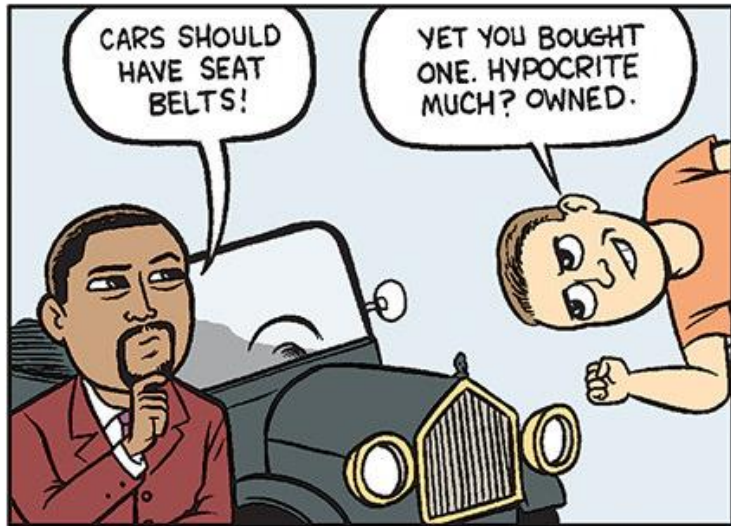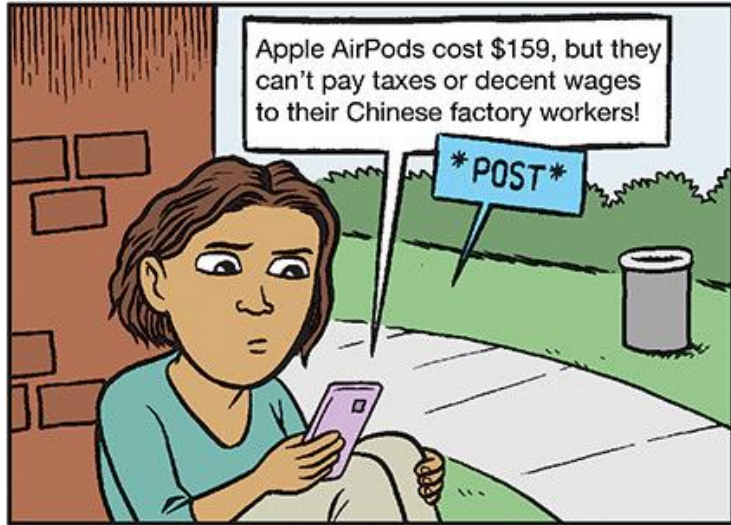
A Wise Man Once Said,

Image Credit:
It's Sega's Sonic
The Hedgehog
In some kind of
Meme, that's all
I got for ya.

Idealism and Radicalism in Tech

- **Open-Source** isn't just a development approach, it's an ideology, embracing collaboration over commercialization.

- **Hacktivism** exists in a legal grey area, but also has a rich history concerning the freedom of information.

- **Cryptography** is an active field of research, supported by labs, foundations, and sometimes even corporations and governments.

Serious-Minded Academic Reading

- *Computing Machinery and Intelligence*, Alan Turing
- *Do Artifacts Have Politics?*, Langdon Winner
- *Panopticism*, Michael Foucault
- *The Work of Art in the Age of Mechanical Reproduction*, Walter Benjamin
- *A Cyborg Manifesto*, Donna Haraway

Hip, Cool Youtube Videos

- *Data* and *The Trouble With the Video Games Industry*, and PhilosophyTube (https://www.youtube.com/watch?v=fCUTX1jurJ4)

- *Protagony One: Joi*, Innuendo Studios (https://www.youtube.com/watch?v=R943_eAvnWw)

- Woke Brands, HBomberGuy (https://www.youtube.com/watch?v=06yy88tLWlg)

Recap: A People's History

- As **workers**, software engineers face a number of challenging labour rights issues.
- The **demographic skew** of the tech industry can lead to **narrow perspectives** and **unhealthy work cultures**.
- **Women in tech** face additional obstacles, which we should all be working to rectify.
- The technology we develop can have **significant social impacts**, and we should work **individually and collectively** to move in the right direction.